PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference TS 1393 PCT	**FOR FURTHER ACTION**	See Form PCT/IPEA/416
International application No. PCT/EP2004/051345	International filing date *(day/month/year)* 02.07.2004	Priority date *(day/month/year)* 03.07.2003
International Patent Classification (IPC) or national classification and IPC B01D50/00, C10G11/18, B01D45/16		
Applicant SHELL INTERNATIONALE RESEARCH MAATS... et al.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☒ *sent to the applicant and to the International Bureau)* a total of 1 sheets, as follows:
      ☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the opinion
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
13.04.2005	23.09.2005
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Maremonti, M Telephone No. +49 89 2399-8440

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/EP2004/051345

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
   - ☐ international search (under Rules 12.3 and 23.1(b))
   - ☐ publication of the international application (under Rule 12.4)
   - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

2-6	as originally filed
1	received on 29.04.2005 with letter of 29.04.2005

Claims, Numbers

1-9	as originally filed

Drawings, Sheets

1/1	as originally filed

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

* *If item 4 applies, some or all of these sheets may be marked "superseded."*

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	5,8
	No:	Claims	1-4,6,7,9
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-9
Industrial applicability (IA)	Yes:	Claims	1-9
	No:	Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following documents and particularly to the passages cited in the search report, unless otherwise specified:

   D1: US-A-4 556 479
   D2: US-B2-6 551 565
   D3: US-A-4 208 384

1.1 The present application does not meet the requirements of the PCT, because the subject-matter of independent claim 1 is not novel in the sense of Article 33(2) PCT. Claim 1 calls for a process suitable for the separation of solids from a gas containing more than 100 mg/Nm^3 solids, comprising passing the gas to a separator, whereby an almost solid-free overflow and an underflow containing the separated solids are produced. The underflow is sent to a cyclone wherein part of the solids are separated and a gas still containing some solids is obtained. The latter is contacted with water to remove remaining solids. The resulting gas is then combined with the overflow of the first separator. A process of solids separation from a gas, comprising all above mentioned steps is known from both documents D1 and D2, which are hence both regarded as to anticipate the subject-matter of claim 1.
It has to be noted that in the processes according to both D1 and D2, also the almost solid-free gaseous overflow obtained from the first separator is contacted with water to remove the still remaining solids. Even if this step is not mentioned in the claimed process, it is also not excluded from the present formulation of independent claim 1. Hence, this further step described in D1 and D2 does not distinguish the processes disclosed therein from the claimed subject-matter.

1.2 It is further observed that the additional features mentioned in claim 1 concerning the solid concentration resulting from steps (a) and©) merely represent a result achieved with the claimed process, which, as such, does not impart any further limitation to the subject-matter of the claim (Article 6 PCT, see also the WIPO PCT Guidelines, Ch. 5, 5.35). In fact, it is assumed that if the process steps as known from the cited prior art

are the same as in the claimed process, also the result obtained by these steps must necessarily be the same.
The same also applies to the features mentioned in claims 3, 6 and 7 which also merely represent results to be obtained with the claimed process without specifying however any additional process feature required to lead to the mentioned results. Therefore, these claims are not considered as to impart any further limitation to the subject-matter of the claims to which they refer (Article 6 PCT).

1.3 Dependent claims 2-9 do not appear to contain any additional feature which, in combination with the features of any claim to which they refer, meets the requirements of the PCT with respect to novelty and inventive step (Article 33(2) and (3) PCT). In fact, dependent claims 3, 6 and 7, as mentioned above, do not impart any further limitation to the subject-matter of the claims to which they refer. All features mentioned in the remaining claims are either known from D1-D2 or they are regarded as obvious design possibilities for a person skilled in the art, also in view of the other documents cited in the search report and of D3 in particular.

TS 1393 PCT

PROCESS TO SEPARATE SOLIDS FROM A SOLIDS LADEN GASEOUS FLOW

Field of the Invention

The field of the invention is fluidized catalytic cracking (FCC) of heavy hydrocarbon feeds, regeneration of said catalyst and separation of said catalyst from the flue gasses generated in said regeneration.

Description of Related Art

US-A-4208384, US-A-6551565 and US-A-4556479 disclose processes to separate catalyst from FCC flue gasses.

A paper titled "FCCU Particulate Emissions Control with a Shell Third Stage Separator - A Case Study" as presented by Edwin H. Weaver, of Belco Technologies Corporation at the 2002 NPRA, New Orleans describes how catalyst fines are separated from the flue gas of a FCC regenerator. According this paper Third Stage Separators (TSS) have been utilized for many years to separate catalyst fines from the regenerator flue gas in order to protect turbo expanders installed downstream said separator. Typical third stage separators are for example described in Hydrocarbon Processing, January 1985, 51-54. For many years, the TSS has been used as an effective device to remove catalyst fines from the FCCU regenerator flue gas in order to provide protection for a turbo expander. In this service, it was critical that the TSS removes a sufficient quantity of the catalyst fines so that the remaining catalyst fines in the flue gas would not damage the turbo expander.

In a TSS solids are separated from the majority of the gas flow by means of a plurality of swirl tube